

AMENDMENTS TO THE SPECIFICATION

Replace second full paragraph on page 2 with the following new paragraph:

In the foregoing portable radio equipment (mobile station), an oscillator which is inexpensive and low precision, is frequently used as an internal oscillator in the equipment for lowering cost. Therefore, automatic frequency control is required. At this time, frequency shift is derived in the following manner.

Replace third full paragraph on page 2 with the following new paragraph:

A phase, derived by multiplying one of two symbols (which are taken at a generation timing of the internal oscillator by receiving a known data, such as modulated pilot signal or the like in a base station;) by a complex conjugate of the other symbol, represents a phase difference of two symbols. In case of the signal, in which two symbols of the known signal are the same phase when the frequency of the internal oscillator is correct, the derived phase shift is divided by an interval of two signals to derive the frequency shift of the internal oscillator.

Replace first full paragraph on page 19 with the following new paragraph:

In the drawings:

Fig. 1 is a block diagram showing a construction of one embodiment of a portable radio system according to the present invention;

Figs. 2A to 2E are ~~is~~ a diagrammatic illustration showing a transmission format in one embodiment of the present invention;

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Patent Application No. 09/828,861

Fig. 3 is a flowchart showing a signal processing in one embodiment of the present invention;

Fig. 4 is a flowchart showing a control of one embodiment of the present invention;

Fig. 5 is a flowchart showing a control of one embodiment of the present invention;

Fig. 6 is a flowchart showing a signal processing in another embodiment of the present invention; and

Fig. 7 is a block diagram showing a construction of another embodiment of the portable radio system according to the present invention.

Replace second full paragraph on page 21 with the following new paragraph:

A radio wave transmitted from the base station antenna 16 is received by the mobile station antenna 20 and is transmitted to the mobile station radio portion 21 as a received signal 121. The mobile station radio portion 21 performs down-conversion and Quadrature demodulation to output a QPSK analog signal 112_122. The QPSK analog signal 112_122 is converted into a QPSK digital signal 123 by the A/D converter 22 to be input to the synchronization detecting portion 28 of the signal processing portion 27.

Replace paragraph spanning pages 24 and 25 with the following new paragraph:

Fig. 3 is a flowchart showing a signal processing in one embodiment of the present invention. Operation of one embodiment of the present invention will be discussed with reference to Fig. 3. Here, the signal processing shown in Fig. 3 is shows an example for

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Patent Application No. 09/828,861

enabling calculation of \tan^{-1} within a range of $\pm \pi$ by using CORDIC for calculation of \tan^{-1} (ArcTangent) in the expression (1) and using $\pm(\pi/2)$ rotate (phase rotation, $\pi = 180^\circ$).

Replace third full paragraph on page 25 with the following new paragraph:

When CORDICq is positive ($\text{CORDICq} > 0.0$), a phase of the signal expressed by ($\text{CORDICi}, \text{CORDICq}$) is rotated over $-(\pi/2)$, and $+(\pi/2)$ is replaced for phase (step S5 of Fig. 3). When CORDICq is negative ($\text{CORDICq} < 0.0$), phase of the signal indicated by ($\text{CORDICi}, \text{CORDICq}$) is rotated over $+(\pi/2)$ and $-(\pi/2)$ is replaced for phase (step S4 of step S4 Fig. 3).

Replace second full paragraph on page 26 with the following new paragraph:

These equations exchange signals CORDICi and CORDICq and inverting invert sign. Therefore, it can be realized with quite simple hardware.